

What is claimed is:

1. A composite coated wood construction product comprising:
 - a wood-based substrate; and
 - 5 a composite layer coating a surface of the wood-based substrate, wherein the composite layer includes a polymer and an organic filler.
2. A composite coated wood construction product according to claim 1, wherein the wood construction product is a structural wood construction product.

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3. A composite coated wood construction product according to claim 1, wherein the composite layer encapsulates the wood-based substrate.
4. A composite coated wood construction product according to claim 1, wherein the composite layer further includes an inorganic filler.
- 15 5. A composite coated wood construction product according to claim 4, wherein the inorganic filler is at least one of talc, calcium, mica, clay, nanocomposite material, and flyash.

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6. A composite coated wood construction product according to claim 4, wherein a combination of all inorganic fillers is substantially between 5% and 35% by weight of the composite layer.
- 25 7. A composite coated wood construction product according to claim 1, wherein the organic filler is at least one of saw dust, wood flour, wood fibers, by products of paper manufacturing, and recycled cellulosics.
8. A composite coated wood construction product according to claim 1, wherein the 30 organic filler is an agro-fiber.

9. A composite coated wood construction product according to claim 8, wherein the agro-fiber is one of rice hulls, wheat shaft, flax, sugar cane, peanut shells, kenaf, and coconut shells.

5 10. A composite coated wood construction product according to claim 1, wherein a combination of all organic fillers is substantially between 20% and 80% by weight of the composite layer.

10 11. A composite coated wood construction product according to claim 10, wherein the combination of all organic fillers is substantially between 30% and 60% by weight of the composite layer.

15 12. A composite coated wood construction product according to claim 1, wherein the polymer includes at least one of polyethylene, polypropylene, polystyrene, ABS, polyvinyl chloride, and polyester.

13. A composite coated wood construction product according to claim 1, wherein the composite layer is foamed.

20 14. A composite coated wood construction product according to claim 13, wherein the composite layer includes a chemical blowing agent.

15. A composite coated wood construction product according to claim 13, wherein the composite layer includes a physical blowing agent.

25 16. A composite coated wood construction product according to claim 13, wherein a foamed composite layer has substantially between 5% and 80% less weight than an unfoamed composite layer with substantially the same volume as the foamed composite layer.

17. A composite coated wood construction product according to claim 16, wherein a foamed composite layer has substantially between 10% and 50% less weight than an unfoamed composite layer with substantially the same volume as the foamed composite layer.

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18. A composite coated wood construction product according to claim 1, wherein the composite layer includes an additive to increase the strength of the composite coated wood construction product.

10 19. A composite coated wood construction product according to claim 1, wherein the composite layer includes at least one of a crosslinking agent, a compatibilizers, a colorant, and a processing aid.

15 20. A composite coated wood construction product according to claim 1, wherein the polymer includes an interpolymer.

21. A composite coated wood construction product according to claim 1, wherein the composite layer further includes a biocide.

20 22. A composite coated wood construction product according to claim 1, wherein the wood-based substrate includes dimensional lumber.

23. A composite coated wood construction product according to claim 1, wherein the wood-based substrate includes milled shapes.

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24. A composite coated wood construction product according to claim 1, wherein the wood-based substrate includes one of solid wood, compressed wood, and particle board.

25. A composite coated wood construction product according to claim 1, wherein the
30 wood-based substrate is treated with a protecting agent.

26. A composite coated wood construction product according to claim 1 further comprises at least one additional layer.
27. A composite coated wood construction product according to claim 26, wherein the at least one additional layer includes an adhesive.
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28. A composite coated wood construction product according to claim 26, wherein the at least one additional layer includes a coextruded layer.
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29. A composite coated wood construction product according to claim 26, wherein the at least one additional layer is foamed.
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30. A composite coated wood construction product according to claim 1, wherein the composite layer is substantially between 0.005 inches and 0.500 inches thick.
31. A composite coated wood construction product according to claim 1, wherein the composite layer is substantially between 0.5 inches and 3.0 inches thick.
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32. A composite coated wood construction product comprising:
20 a wood-based substrate; and
a composite layer coating a surface of the wood-based substrate,
wherein the wood construction product has an exterior surface substantially the same as an exterior surface of a non-structural plastic composite.
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33. A method of manufacturing a composite coated wood construction product comprising the steps of:
coating a surface of a wood-based substrate with a layer of a composite melt; and
cooling the layer of composite melt,
wherein the composite melt includes a polymer and an organic filler.
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34. A method according to claim 33, wherein the step of coating further includes extruding the layer of composite melt.
35. A method according to claim 34, wherein extruding the layer of composite melt includes extruding the layer of composite melt using at least one of a single screw extruder, a twin screw extruder, a tandem extruder, and a continuous mixer/extruder combination.
36. A method according to claim 34, wherein the step of coating further includes feeding the composite melt into a first entrance of a cross head die; and feeding the wood-based substrate to a second entrance of the cross head die.
37. A method according to claim 34 further comprising the step of coextruding an additional layer.
38. A method according to claim 37, wherein the additional layer is a tie layer between the layer of composite melt and the wood-based substrate.
39. A method according to claim 37, wherein coextruding an additional layer includes foaming the additional layer.
40. A method according to claim 33 further comprising the step of foaming the layer of composite melt.
41. A method according to claim 33, wherein coating the surface includes altering a portion of a surface of the composite melt layer to create texture on the surface.